Project Introduction

The process of aircraft design requires the integration of data from individual analysis of aerodynamic, structural, thermal, and behavioral properties of a flight vehicle. At present, there is no simple way to integrate the results of the analyses early in the design process. Aurora Flight Sciences and the Massachusetts Institute of Technology Aerospace Computational Design Laboratory propose to create a system level analysis framework called the Extensible Data Set Architecture to facilitate this integration, and therefore provide rapid system-wide impact assessment of design changes to a flight vehicle. The Extensible Data Set Architecture (EDSA) is a generic data storage structure ready for use by a diverse and extendable set of software tools and codes. The EDSA can be arbitrarily extended to allow additional functionality and provides a natural framework for future development of aerospace systems. The framework includes as part of its structure the relevant metadata for ensuring version control, traceability, context-specific documentation, and interface data for relevant tools, while providing a simple structure for extending an existing data set to transparently include new members. The four primary components of this framework will be 1) an extensible data set used by all codes and analysis tools to store and exchange relevant information; 2) a tool set which can take advantage of the data set, made up of both existing programs and user defined vehicle specific codes; 3) a controller which provides organization, operates the tools, and manages iteration and optimization of the design, and 4) a display code which presents the results of the analysis to the user.

Primary U.S. Work Locations and Key Partners
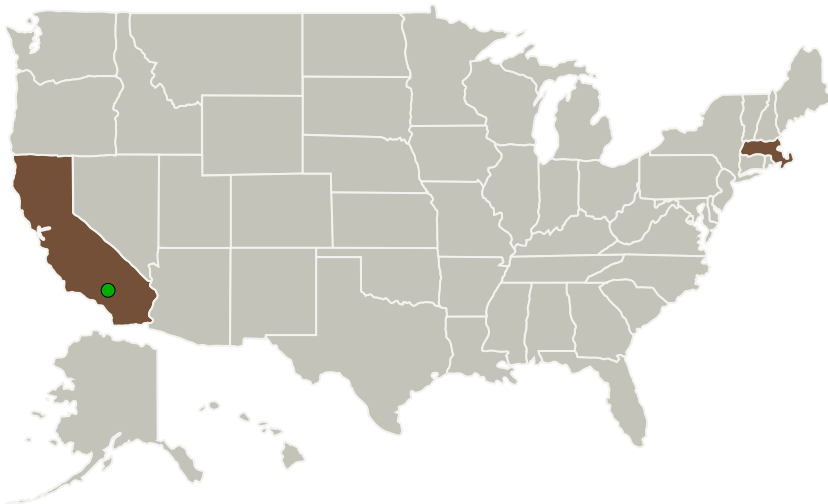

Extensible Data Set Architecture for Systems Analysis, Phase I

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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Organizations Performing Work	Role	Type	Location
🟢Armstrong Flight Research Center(AFRC)	Supporting Organization	NASA Center	Edwards, California
Massachusetts Institute of Technology(MIT)	Supporting Organization	Academia	Cambridge, Massachusetts

Primary U.S. Work Locations	
California	Massachusetts

Project Transitions

▶️ **January 2010:** Project Start

✅ **January 2011:** Closed out

Closeout Documentation:
- Final Summary Chart(*https://techport.nasa.gov/file/138990*)

Project Management

Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
James Houghton

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**

1	2	3	4	5	6	7	8	9
Applied Research			Development			Demo & Test		
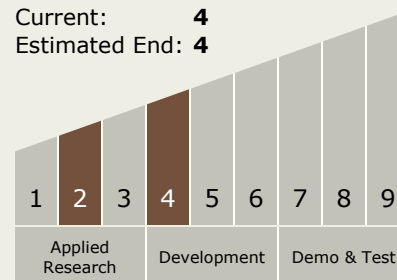
Technology Areas

Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
  └ TX11.4 Information Processing
    └ TX11.4.1 Science, Engineering, and Mission Data Lifecycle

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Target Destinations
The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System